

REMARKS

Claims 13, 14, and 17 have been canceled without prejudice or disclaimer as being drawn to a non-elected invention. The applicant reserves the right to pursue the canceled claims, and claims to any other subject matter which is disclosed in the application and drawings, in one or more continuing applications. Dependent claim 9 is canceled. Claims 1-8, 10-12, and 15-16 are amended. The application now includes claims 1-8, 10-12, and 15-16.

Claims 1, 2, 5-7, and 15-16 were rejected for indefiniteness. Based on the amendments above, the requirements of 35 U.S.C. 112, second paragraph, are now satisfied. In particular, the spelling error for the "non-oxygen-containing exhaust gas" has been corrected in claim 1. Claim 1 has also been amended to separately recite, removal, purification, and re-introduction steps, thus making clear that the heat storage material which forms the bed is removed, purified to remove adhesions (e.g., SiO_2 coated on the surfaces of the heat storage material which makes up the bed), and re-introduced into the regenerator to re-establish the bed of heat storage material. In dependent claims 5, 6, and 16, it is now specified that the at least one regenerator includes two or more regenerators. Words such as "it", "the plant", "the regenerators", etc. have been removed from the claims.

The present invention is focused on solving the problem of clogged regenerator-storage materials during regenerative post-combustion of exhaust gases containing organosilicon components. As explained on page 2, lines 22-27, prior regenerative post combustion (RPC) processes suffered from the regenerator storage materials being coated with the oxidation product SiO_2 when organosilicon products are present in the exhaust gases. This coating which occurs clogs the regenerator materials (e.g., a monolithic honeycomb) and, in prior art systems, necessitates a shut down and intensive laborious process for cleaning. As a result, in prior art RPC systems, the treatment of exhaust gases laden organosilicon compounds was typically not offered (e.g., as noted on page 2, lines 35-36, this treatment was ruled out in technical offer documents).

The claimed invention employs a storage material that is at least partly a bed (see page 5, line 3). That is, the storage material bed includes, for example, ceramic or steel spheres, pebbles, expanded clay, larva, etc. As explained on page 6, lines 6-8, the regenerative preheating and cooling as well as the oxidation of the exhaust gas are effected within the regenerator bed. As explained on page 7, lines 5-6, the storage material may also include conventional elements such as honeycombs. As explained on page 7, lines 19-35, the invention includes a removable bed connected to the discharge or an RPC or TPC plant. When removed through the discharge, the materials of the bed are provided to a separation apparatus which separates silica adhesions by friction, pressure spraying, ablative methods, etc. Thereafter, the purified bulk storage material is recycled to the regenerator.

Figure 1 shows the bed being removed through discharge 15; purification at the separation apparatus 16; and refilling of the regenerator bed 1 at 18 via means of a transport device 17. As explained on page 9, lines 28-32, and with reference to Figure 3, the oxidation product SiO_2 of organosilicon compounds in the exhaust gases form amorphous adhesions on the storage material. This also occurs in the reverse flow pattern shown in Figure 4. As explained on page 10, lines 18 et seq., over the course of time, the silica adhesions build up and thus increase flow resistance. In a preferred manner, when a threshold pressure drop is detected, the bed is cooled, and the bed material with the adhesions is removed via discharge 15 and cleaned (see Figure 6) by the separation apparatus 16, and, after separation of the SiO_2 adhesions, the storage material is passed back into the regenerator at 18. Thus, the claimed invention makes it possible to remove, purify and re-introduce the heat storage material under operating conditions.

Claims 1-12 and 15-16 were rejected as being obvious over JP 2002-061822 in view of U.S. Patent 4,940,567 to Ohlmeyer. This rejection is traversed.

As acknowledged by the Examiner JP '822 does not disclose a heat storage material being used as a bed. Rather, similar to the prior art, the heat generative elements of the JP '822 must be cleaned periodically. However, as set forth in paragraph [0009] silicon which is crystallized and adhered to the heat generative

elements has dramatically high hardness, and the removing operation is very difficult and the overall operation efficiency fell. To address this JP '822 uses a system with two regenerators and through temperature control. Note particularly paragraph [0020] where JP '822 describes a temperature control measure where the temperature of heat used is less than that for organic silicon to turn into silica and/or crystal like silicon. Thus, it is clear that JP '822 does not disclose or permit in process removal of silica coated heat storage material, purification to remove silica adhesions, and reintroduction of the purified heat storage material into a regenerator to allow further use in thermal purification of an exhaust gas (each of which are required in the claimed invention). Further, it is clear that JP '822 recognizes a known problem in paragraph [0009] and attempts to address the problem in a completely different manner than is envisioned and claimed by the present application.

U.S. Patent 4,940,567 to Ohlmeyer does not make up for the deficiencies of JP '822. Ohlmeyer relates to an apparatus for catalytically reducing noxious substances in flue gas. Although the heat storage element can be removed from circulation and replaced by regenerated elements, it is noted that the heat storage elements are regenerated with respect to its catalytic activity (this is not akin to removing SiO₂ adhesions). The heat storage elements of Ohlmeyer comprise catalytically active catalyst coated heat storage elements and regeneration reflects regeneration of the catalytic activity of the catalyst only. Ohlmeyer does not describe a problem similar to purification of heat storage elements having adhesions on the surface derived from organosilicon compounds.

Having the benefit of Japan '822 and Ohlmeyer, one of ordinary skill in the art would not deduce the claimed invention. One of ordinary skill in the art would recognize Japan '822 seeks to avoid the problem of SiO₂ adhesions from the oxidation of organosilicon constituents in exhaust gas by judicious temperature control to avoid formation of such materials, and Ohlmeyer does not address removal of adhesions, but rather regeneration of catalytic surfaces.

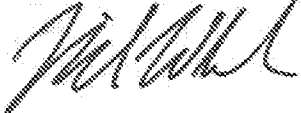
In view of the foregoing, it respectfully requested that the application be reconsidered, that claims 1-8, 10-12, and 15-16 be allowed, and the application be

passed to issue.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

A provisional petition is hereby made for any extension of time necessary for the continued pendency during the life of this application. Please charge any fees for such provisional petition and any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael E. Whitham", written in a cursive style.

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